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## 15 years of Fraunhofer IZM-ASSID: The future of microelectronics shaped by Fraunhofer IZM's Dresden site

**With a festive event and a symposium on 24 June 2025, Fraunhofer IZM-ASSID (All Silicon System Integration Dresden) celebrated 15 years of success in its field. Since its foundation in 2010, the Fraunhofer IZM's Saxon site has become a globally respected engine of innovation in 3D system integration and wafer-level packaging - and a crucial actor in Europe's high-technology ecosystem.**

### From technological vision to industrial platform

When Professor Herbert Reichl originally ventured the idea of establishing another site of Fraunhofer IZM in Saxony in 2010, his initiative led to the creation of the very first 300mm research infrastructure in Germany, including industry-grade cleanroom facilities perfectly suited for 3D integration work. Located right in the middle of what would come to be known as Silicon Saxony, a unique research campus for innovative technologies was born with the support of the German Ministry of Education and Research, the Free State of Saxony, the EU Commission, and the Fraunhofer Society - a place where fundamental research met real-world industry applications.

### Technological milestones en route to a connected world

Many major technological milestones have been passed over the last 15 years at Fraunhofer IZM-ASSID, with new ways to process Through-Silicon-Vias (TSV), multi-layered redistribution layers, and high-performance chip stacking solutions. The Institute continues to work on high-precision hybrid bonding, which is indispensable for today's chiplet architectures and quantum computing.
The innovations include the use of silicon interposers with integrated liquid cooling to manage the heat given off by high-performance processors - an idea with potential for data centers as much as for mobile devices or the self-driving cars of tomorrow. The evolution of increasingly miniaturized sensor platforms used in medical implants like neural stimulators has also been advanced at the Saxon site.

### CEASAX and APECS: Two flagship projects to protect Europe's technological edge

The Center for Advanced CMOS and Heterointegration Saxony (CEASAX) was founded in 2024 in partnership with Fraunhofer IPMS. CEASAX covers the entire 300mm microelectronics value chain, from the first design to a test-ready product. The new 4,000 sqm cleanroom facilities in Dresden offer an ideal environment for researching neuromorphic architectures, quantum integration, and edge AI.

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Fraunhofer IZM-ASSID is also a key actor in the formation of the APECS (Advanced Packaging and Heterogeneous Integration for Electronic Components and Systems) pilot line, one of the headline projects of the EU Chips Act. Dr. Manuela Junghähnel, Site Director at Moritzburg, explains: „This is where the technologies for chiplets are born that will give developers a new quality of freedom in terms of the performance, sustainability, and costs of their systems with their modular design. The one-stop-shop thinking behind the APECS pilot line gives SMEs in particular access to cutting-edge microelectronics manufacturing capacities, from prototyping to pre-series production."

**International cooperation and strong networks**

As an active part of Silicon Saxony e.V. and constituent partner of the Research Fab Microelectronics Germany (FMD), Fraunhofer IZM-ASSID has excellent connections in the field - both regionally and far beyond Germany's borders. It maintains strategic cooperations with partners including GlobalFoundries, Infineon Technologies, Siemens, NXP, imec and CEA-Leti. Finally, its close ties with the Technical University of Dresden, in the form of the chair for „Nanomaterials for Electronics Packaging" held by Professor Juliana Panchenko, guarantee a constant stream of know-how between the academic world and more application-driven research.

Professor Holger Hanselka, President of the Fraunhofer Society, celebrated the Dresden-based organization by saying: „The contributions of Fraunhofer IZM-ASSID to the APECS-Pilotlinie will play a major role in shaping how the Fraunhofer Society is advancing major digital projects in the interest of Germany's and Europe's future as a hub of innovation. At the same time, CEASAX is bringing together Fraunhofer's unique capabilities in microelectronics research to create the ideal conditions for researching our digital future and becoming a cornerstone for our country's technological resilience. I applaud Fraunhofer IZM-ASSID for 15 years of successful research in Dresden, the home of high technology."

**Festive Event and Symposium on 24 June 2025**

The anniversary was marked by a special festive event and symposium on „Next-Generation 3D Heterointegration" in Dresden. The proceedings included keynote lectures, technology demonstrations, and roundtable discussions with representatives from industry, academia, and politics. The celebrations brought speakers from all three worlds to the site to honour the ideas and the commitment of Fraunhofer IZM-ASSID's people and recognize the support that the site has enjoyed over the years.

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**The speakers at the event celebrating 15 years of Fraunhofer IZM-ASSID in Moritzburg / f.l.t.r.: Prof. Klaus-Dieter Lang (former Director Fraunhofer IZM), Prof. Martin Schneider-Ramelow (Director Fraunhofer IZM), Prof. Ulrike Ganesh (Managing Director Fraunhofer IZM), Prof. Albert Heuberger (Executive Director Fraunhofer IIS), Dr. Manuela Junghähnel (Site Manager Fraunhofer IZM-ASSID), Dr. Stephan Guttowski (FMD), M. Jürgen Wolf (former Site Manager Fraunhofer IZM-ASSID), Dr. Babett Gläser (SMWK), Dr. Christian Koitzsch (ESMC), Frank Bösenberg (Silicon Saxony e.V.)**
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**Fraunhofer IZM-ASSID in Saxony has become synonymous with semiconductor research and development on 300mm wafers ©Sylvia Wolf, Fraunhofer IZM**
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The **Fraunhofer-Gesellschaft**, headquartered Germany, is the world's leading applied research organization. With its focus on developing key technologies that are vital for the future and enabling the commercial exploitation of this work by business and industry, Fraunhofer plays a central now and in the future. Founded in 1949, the Fraunhofer-Gesellschaft currently operates 75 institutes and research institutions throughout Germany. The majority of the organization's 32,000 employees are qualified scientists and engineers, who work with an annual research budget of 3.6 billion euros. Of this sum, 3.1 billion euros are generated through contract research.

Highly integrated microelectronics are omnipresent and yet often evade the eye. With 4 central technology clusters, **Fraunhofer IZM** covers a wide range of areas in quantum, as well as medical, communications and high-frequency technology. With our world-leading expertise, we offer our customers cost-effective development and reliability assessment of electronic packaging technologies, as well as custom-tailored system integration technologies at wafer, chip and board level. For over 30 years and at 3 locations, we have been supporting start-ups as well as medium-sized and large international companies (with knowledge transfer) and researching key technologies for intelligent electronic systems of the future

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